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English 16 photos, table (Same)

TAS) and the amount of oscillation were determined for the 45 in.
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obtainable from CADO.

Mines, Parachute
U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

REPORT NO. 346

MINE AND MINE COMPONENT TESTING
UNDER
TASK ASSIGNMENT NPG-33-Re6b-311-1

6th Partial Report

AIRCRAFT DROPS OF MINES, MK. 45,
EQUIPPED WITH 45 INCH DIAMETER
GUIDE SURFACE PARACHUTES

Task Assignment NPG-33-Re6b-311-1

Classification RESTRICTED

PART A

SYNOPSIS

1. This is a report on aircraft drops of Mines, Mk. 45, equipped with 45 inch diameter guide surface parachutes, to determine the maximum launching velocity (true air speed) and the amount of oscillation. Two types of shroud line configuration were provided, crossed and straight.

2. It is concluded that:

   a. The ten parachutes tested withstood opening shock without damage at release speeds up to 430 knots (TAS).

   b. The ten parachutes tested quickly damped the large mine oscillations and provided good flight for the Mines, Mk. 45.

   c. Oscillation of the mines equipped with "straight" shroud line arrangement was negligible after damping. The mines equipped with "crossed" shroud line arrangement oscillated very slightly during the entire flight of the mine.

   d. The pack cover plates separated from the chutes at or immediately after chute opening on all drops. The metal plate and "U" bolt pulled through the fiber glass pack cover in each of five drops; the retaining line broke in each of the remaining five drops.

   e. The center stud neck failed to shear in each of four releases.

3. It is recommended that:

   a. The method of securing the pack cover to the chute be strengthened, consideration being given to:

      (1) Increasing the size of the metal strengthening plate.
      (2) Using strengthening plates on both sides of the cover.
      (3) Using a "U" bolt of larger span.
      (4) Using a stronger retaining line, with consideration being given to a shorter line to reduce whip during flight.
Aircraft Drops of Mines, Mk. 45
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

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APPENDIX A - NPG MOVIE NO. 813 (ORIGINAL ONLY, DELIVERED BY HAND TO NAVAL ORDNANCE LABORATORY, FIELD EVALUATION DIVISION.)

APPENDIX B - NPG PHOTOGRAPHS ..................... FIGURES 1 - 2 (Incl)

APPENDIX C - TABULATED RESULTS .................. TABLE I

APPENDIX D - DISTRIBUTION ........................ PAGES 1 - 2 (Incl)
Aircraft Drops of Mines, Mk. 45
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

PART B

INTRODUCTION

1. AUTHORITY:

This test was requested by reference (a), and was conducted under Task Assignment No. NPG-33-Re6b-311-1 authorized by reference (b). Reference (a) requested that the test be conducted in accordance with the outline in reference (c).

2. REFERENCES:

   b. BuOrd ltr. NP9(Re6b) dated 3 September 1948.
   c. NOL TSS No. 5609.

3. BACKGROUND:

   a. This test is part of a program to develop more satisfactory parachutes for aircraft laid mines.

   b. Reference (d) is the report of a test to determine the operation and flight characteristics of 45 inch diameter Guide Surface Parachutes and to determine the terminal velocity of the Mine, Mk. 45, equipped with this parachute.

4. OBJECT OF TEST.

This test was conducted to determine the maximum launching velocity (true air speed) and the amount of oscillation of the 45 inch diameter Guide Surface Parachutes with each of two types of shroud line configuration using Mk. 45 Mines as the parachute load.
5. PERIOD OF TEST:

a. Date of Project Letter 18 May 1949
b. Date Necessary Material Received 25 May 1949
c. Date Commenced Test 6 June 1949
d. Date Completed Test 6 June 1949

6. REPRESENTATIVES PRESENT:

G. L. Fogal Naval Ordnance Laboratory
C. C. Ripley

PART C

DETAILS OF TEST

7. DESCRIPTION OF ITEM UNDER TEST:

a. The guide surface parachutes used in this test were identical to those reported in reference (d) except that:

   (1) The parachute pack cover was secured to the apex of the parachute by an 8-1/2 ft. length of 950 lb. strength nylon cord as shown in Figure 1.

   (2) Two strands of 50 lb. strength nylon cord were attached to the static line and secured to the apex of the chute as shown in Figure 1 to pull the chute from the pack after release of the cover.

b. The Pack Housing, XH-5B, was identical to that reported in reference (d) except that a "U" bolt was inserted from the bottom of the cover through a metal plate approximately 1" x 2" on the top side of the cover for securing the cord described in paragraph 7, a. (1) above. Figure 2 shows the "U" bolt head and metal plate.
8. DESCRIPTION OF TEST EQUIPMENT:

a. Drops were made from the fuselage installation of an F7F-3 type aircraft which has been equipped with a Mk. 51 Mod. 12 bomb rack.

b. A Mitchell camera with 17-inch lens was used to photograph the release of the mines and operation of the parachutes from the ground. A clock with a one-second sweep was included in the corner of each frame. This was supplemented by visual observation.

9. PROCEDURE:

a. Ten inert Mines, Mk. 45, equipped with 45 inch diameter guide surface parachutes were launched from the fuselage installation of an F7F-3 type aircraft in approximately level flight at time of release. Altitudes of release varied between 1500 and 3000 feet indicated. True airspeeds at release varied between 400 and 430 knots.

b. The performance of the parachutes was determined from the film from the Mitchell Camera, supplemented by visual observation of the drops and inspection of the recovered units.

10. RESULTS AND DISCUSSION:

a. The first five units, using "crossed" shroud line arrangement, were dropped at true airspeeds of 400 knots to 428 knots. The parachutes opened and held without damage, quickly damping the large oscillations. All five units had good flight with very slight oscillation. The pack cover stayed on the chute for two seconds of flight on the first drop. The remaining four separated at opening of the chutes.

b. The second five units, using "straight" shroud line arrangement, were dropped at true airspeeds of 422 knots to 430 knots. The parachutes opened and held without damage, quickly damping the large oscillations. All five units had good flight with negligible oscillation. The pack covers separated from the chutes at opening.
PART D

CONCLUSIONS

11. It is concluded that:

a. The ten parachutes tested withstood opening shock without damage at release speeds up to 430 knots (TAS).

b. The ten parachutes tested quickly damped the large mine oscillations and provided good flight for the Mines, Mk. 45.

c. Oscillation of the mines equipped with "straight" shroud line arrangement was negligible after damping. The mines equipped with "crossed" shroud line arrangement oscillated very slightly during the entire flight of the mine.

d. The pack cover plates separated from the chutes at or immediately after chute opening on all drops. The metal plate and "U" bolt pulled through the fiber glass pack cover in each of five drops; the retaining line broke in each of the remaining five drops.

e. The center stud neck failed to shear in each of four releases.

PART E

RECOMMENDATIONS

12. It is recommended that:

a. The method of securing the pack cover to the chute be strengthened, consideration being given to:

   (1) Increasing the size of the metal strengthening plate.

   (2) Using strengthening plates on both sides of the cover.

   (3) Using a "U" bolt of larger span.

   (4) Using a stronger retaining line, with consideration being given to a shorter line to reduce whip during flight.

PART F

DISPOSITION OF MATERIAL

13. The ten parachutes tested were recovered for the representatives. The mine cases were recovered for reuse.

PREPARED BY: J. B. KING
Project Engineer

SUBMITTED: L. G. HANSEN
Lieutenant Commander, USN
Aviation Ordnance
Special Projects Officer

CONCUR: M. P. BAGDANOVIČ
Captain, USN
Aviation Ordnance Officer

CONCUR: W. C. BRYSON
Captain, USN
Experimental Officer

APPROVED: C. T. JOY
Rear Admiral, USN
Commander, Naval Proving Ground

C. H. ANDERSON
Captain, USN
Ordnance Officer
By direction
Sixth Partial Report

on

Mine and Mine Component Testing

under

Task Assignment NPG-33-Re6b-311-1

Final Report

on

Aircraft Drops of Mines, Mk. 45, equipped with 45 Inch Diameter Guide Surface Parachutes
Aircraft Drops of Mines, Mk. 45,  
Equipped with 45 Inch Diameter  
Guide Surface Parachutes.

NPG MOVIE NO. 813

(ORIGINAL ONLY, DELIVERED BY HAND  
TO NAVAL ORDNANCE LABORATORY,  
FIELD EVALUATION DIVISION.)
WP9 38726 - Parachute Pack Housing, XH-5B, showing the ends of the "U" bolt protruding through the pack cover and the metal strengthening plate.
9 June 1949

RESTRICTED

TABULATED RESULTS

6 June 1949

<table>
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<tr>
<th>Drop No.</th>
<th>True Shroud Drop Altitude (ft.)</th>
<th>True Airspeed (Knots)</th>
<th>True Weight (lbs)</th>
<th>Shroud Line Arrangement</th>
<th>Remarks</th>
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<tr>
<td>1</td>
<td>1700</td>
<td>400</td>
<td>not weighed</td>
<td>&quot;Crossed&quot;</td>
<td>Parachute opened and held without damage. Good flight—very slight oscillation—cover plate came off after two seconds of fall.</td>
</tr>
<tr>
<td>2</td>
<td>1500</td>
<td>415</td>
<td>not weighed</td>
<td>&quot;Crossed&quot;</td>
<td>Parachute opened and held without damage—Good flight—slight oscillation—cover came off at chute opening.</td>
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<tr>
<td>3</td>
<td>1800</td>
<td>420</td>
<td>384.0 &quot;Crossed&quot;</td>
<td>Same as drop No. 2.</td>
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<td>4</td>
<td>2000</td>
<td>425</td>
<td>412.5 &quot;Crossed&quot;</td>
<td>Same as drop No. 2.</td>
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<tr>
<td>5</td>
<td>2150</td>
<td>428</td>
<td>387.0 &quot;Crossed&quot;</td>
<td>Same as drop No. 2.</td>
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<td>6</td>
<td>2200</td>
<td>422</td>
<td>406.0 &quot;Straight&quot;</td>
<td>Parachute opened and held without damage—Good flight—cover came off at chute opening—oscillation negligible.</td>
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<td>7</td>
<td>3000</td>
<td>430</td>
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<td>407.0 &quot;Straight&quot;</td>
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RESTRICTED APPENDIX C
Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

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NPG-33-Re6b-311-1 - Final Report on Aircraft Drops of Mines, Mk. 45, Equipped  
With 45 Inch Diameter Guide Surface Parachutes - and Appendixes A-D (NPG*)  

AUTHOR(S) : King, J. B.  
ORIG. AGENCY : Naval Proving Ground, Dahlgren, Va.  
PUBLISHED BY : (Same)  

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